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TECHNICAL DEPT.

# AVIATION

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Night view of a National Air Transport hangar at the Kansas City Airport.

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XXIV

## *Special Features*

NUMBER  
8

"The Lone Eagle"  
Crated or Loose?  
Key West to Havana

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No. 2

### Solo Time

**F**LIVING INSTRUCTION like all other branches of the educational game is in a state of change and is hard to lay down any rules as to what is correct and what is not. There is, however, a principle which is encouraged by the present requirements for pilots' licenses that applies to us to be wrong. The matter referred to is the practice of considering that solving practically involves the instruction that the student pilot needs.

Under the present requirements for a private pilot's license the applicant must have had ten hours of solo flight. Both in theory and in practice this is not too much, but the unfortunate part is that the ten hour requirement tends to put down the amount of instruction which the student receives after he has been soloed. A certain amount of solo work is necessary, especially where the student lacks self confidence and must do as well when alone as when he has an instructor along, but in the majority of cases the student will have more and will ultimately be a better pilot if he continues taking instruction after he has been soloed.

Although a certain amount of solo time is an essential condition. It would seem as if instruction received after the student has taken should receive a certain amount of credit. Outside of straight flying there are a great many of semi-combustible maneuvers which are really useful and which the student cannot teach himself. Even after a man has had fifty or more hours of solo time a good instructor can greatly improve his flying.

### Air Mail Contracts

**S**INCE THE air mail laws have been turned over to private companies for operation there has been a noticeable growth in the amount of mail carried. This is partly due to the added incentive of private enterprise but partly to the greater service which has been made available through the development of the system of feeder lines. That this growth will be continued is not to be doubted but the fact that the private lines face serious problems should not be ignored.

Under the present law the contracts for carrying the mail are let out for one year at a time. The members of the government of this competitive bidding for the air mail routes is undoubtedly to keep down the price, but the ultimate result is that the mail service will not grow and develop as it should. There is really an immense amount of pioneering work to be done to improve the regularity of air mail operation and to develop more efficient planes, and whereas almost all the air mail lines would be willing to put any profit which they made into this sort of work they really cannot be asked to spend large amounts of capital in developing when they may lose the contract to a few big

companies and be unable to recover the capital they have spent.

Apparently the only method of stabilizing the situation and having the advantages of competitive bidding is to appoint some sort of a commission which will regulate rates and at the same time see that proper service and facilities are maintained by the contractor. In order that this may be possible it is necessary to have some Congressional action, and a bill has been prepared by Mr. Kelly which would give the Postmaster General authority to negotiate a continuation of contract with those firms which have had a good operating record. The bill, if passed, would in many ways place the Postmaster in much the same position, in regards to the airlines, as the Interstate Commerce Commission holds in regards to the railroads, and would further air transportation more than the present system of competitive bidding.

### Endurance Records

**A**TTEMPTS to break the world endurance record continue, and it would seem as if the Indians really had some sense to it. Taking off with the tremendous loads which are necessary is a great test of the fitting efficiency of the plane and as the engines must run at full speed until part of the fuel is consumed the endurance of the engine is also tested. It must be remembered, however, that as soon as the plane is lightened that the engine is throttled to the lowest possible extent, and the true cruising speed of the plane is not established. A close country distance record flight is a true indication of the practical qualities of a plane, but on the other hand cross country flights even over great distances are greatly affected by weather conditions, especially by favoring winds, and can give an even more false impression than an endurance flight. The real test is the flight back and forth between two points.

In a general way, however, the endurance flight is a rough and ready indication of the efficiency of a weight carrying plane, and also indicates the quality of the workmanship and the detail finish of design. Apparently, weaknesses develop during these long flights which are not revealed by less strenuous tests. One of the important things which have been pointed out is the value of efficient dump valves.

Another interesting fact is the comparatively good performance put up by the three surplus Fokker out on the West Coast. It is very generally considered that these surplus planes are not at all in the same class as single engine planes as far as efficiency goes and it must have been quite a surprise to many people to have had a three engine plane come so close to breaking the world's endurance record. Last but not least the advantages of the endurance records have again demonstrated the reliability of the Wright Whirlwind engines.



"The Lone Eagle" (Ryan Mechanics Monoplane) is in a preliminary test flight

## "The Lone Eagle"

A Four Passenger Cabin Monoplane (Whirlwind) With Wing, Fuselage and Tail Surfaces Built Entirely of Welded Steel Tubing

By CHARLES F. McKEYNOLES

REALIZING the advantages of aerial construction in air planes, a practice which until recently has been confined chiefly to military and a few multi-engine planes, the Ryan Mechanics Monoplane Co., of Los Angeles, Calif., decided to experiment in welded steel tube construction and have produced what is believed to be the first completely all welded airplane in the world. The plane, which is christened "The Lone Eagle," is an extremely broad cabin monoplane powered with a Wright Whirlwind engine. The wing, fuselage and tail surfaces are built entirely of welded steel tubing covered with fabric in the usual manner. With four passengers and pilot it has been estimated from the preliminary tests to have a high speed of 125 m.p.h., a cruising speed of 100-110 m.p.h., and a landing speed of 40 m.p.h.

O. E. McNeil, president of the company, flew The Lone Eagle recently in a preliminary test flight and reported that the plane handled with greater ease and safety than any he has ever flown. Pilot "Dick" Newman of Pacific Air Transport, also flew the new plane and was most enthusiastic over its ease of control.

The design of the Ryan Mechanics Monoplane was worked

out some time ago by the men who later showed the company. Preliminary engineering on the project was done by Otto Trues of Los Angeles, but the final engineering was completed by William Waterhouse, prominent aeronautical designer and engineer. Mr. Waterhouse has been engaged in a consulting capacity and his duties as an engineer coupled with the experience of the founders of this company, in ex-



John (pilot) flies "The Lone Eagle" recently.

February 20, 1933

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plan in structure and factory management should make a very real reduction in cost. As the present trend toward reduction of parasite surfaces the new plane has a full cantilever wing. The great feature of this wing is quite interesting but perhaps even more so is the form of the wing. The leading edge is straight and the rear edges taper toward the tip. The top surface is flat but there is some dihedral on the bottom surface which tapers up toward the tips. The wing curve is a special development. The net result is a high lift wing of comparatively thick section and yet with the promise of considerably greater speeds than the ordinary thick wing design. The wing is expected to prove extremely stable.

### Of Warren Truss Construction

All structures in both wing and fuselage are of Warren truss construction. The wing spans are Warren truss with the wing ribs welded to them and Warren truss cross-pieces welded in. The front spar is straight but the rear spar is parallel to the front spar for only 40 in. toward the cabin and then tapers in toward the leading edge. The rear spar members are reduced in diameter as the spar approaches the wing tip, each successive tube being longer, 10% shorter where it is substituted and welded in. The tubes in the spar vary from 1 1/2 in. with 3/32 wall at the outer end of spar to 3/4 in. at 28 gauge at the wing tip, while the rear members in the spar vary from 1 1/2 in. at 28 gauge at the rear to 3/4 in. at 28 gauge at the ends. There are five heavy bottom spars on each side of the wing, with double wing bracing which is supplemented by the great rigidity given to the wing because of the forward inclination of the rear spar. The wing ribs are built up in 18 separate ribs and are welded in the spars by cutting a section out of the ribs and then fitting in the spar and welding it in place. There are 41 ribs in all with an average weight of two pounds each and spaced a night inch intervals for the center 18 ft. of the wing and a 12 inch intervals from that point on out to the wing tip. The leading edge is reinforced with an aluminum sheet bound in the proper wing curve. The ailerons are of sheeted



One of the officials of the company. Left to right: C. E. McNeil, president and general manager, E. C. Agnew, secretary, O. E. McNeil, vice president, W. F. Russell, vice president, and E. E. Baker, assistant foreman.

and are braced by having the main aileron spar set right over the main fuselage beam which are spaced in 28 gauge steel directly to the rear wing spar. The span of the wing is 27 ft. 10 in., the maximum chord nine feet and the outer section, the maximum five feet at the wing tip, and the average wing chord is seven feet. The area of the wing including ailerons is 224 sq. ft. The wing loading is 12 lb. per sq. ft. The numerous features of the wing is that the left side is approximately one half inch lower at the rear spar is reinforced continuously maintained the propeller torque. The weight

of the wing structure complete has increased a 264 lb., or 1.54 lb. per sq. ft. which is exceptionally low for a full cantilever wing.

The wing is secured to the fuselage by eight tapered bolts in four separate fittings on the upper fuselage longerons. The bolts taper from 3/4 in. to 1/16 in. There are also two brass



Close up of the uncovered nose of "The Lone Eagle" showing the engine tube engine mounting ring

rods extending from the center point of the rear spar to fittings at the upper rear of the cabin and held in the fuselage fitting with 3/16 in. bolts.

The main cabin seats four passengers and is eight feet long, 50 in. high and 42 in. wide. There are two wide doors on the right side of the cabin, each equipped with rubber bumper and rubber hooks and having a welded steel tube ladder built into the plane in such a way that it may be partially slid out in position with one end on the ground and the other hinged at the lower edge of the cabin. These ladders slide out of sight between the cabin floorboards and the fitting and are held in place by a new retracting spring catch.

The cabin is semi-dressed at the back of the two forward doors, by the main wing spar and by the two struts that extend down into the cabin from the spar fittings to the center of the floor. The ceiling has a curve offset over each side with two dome lights built in and the ceiling itself formed of aluminum and built right into the wing. There are three large and two small windows on each side of the cabin, giving a total window space of 64 sq. ft. and having 20 separate glass panes of 1/4 in. plate with ground and polished edges, installed in the plane.

### Cargo Space Behind Cabin

The entire nose end and gold road and motor held in four sockets by bolts. The sockets are upholstered with tapestry over 36 Marshall and springs to each socket. There is a double socket across the rear of the cabin and two reinforced chairs at the front. The cabin is finished in Red Top Finish of Spangher Glass with lacquer backing and aluminum strip finishing at windows and doors held by the upholstery. Behind the cabin is a cargo space, reached from outside, that has 125 sq. ft. of space, or sufficient to carry four large suitcases.

The undercarriage is of built treated chrome molybdenum steel tubing with shimable track and wheel end having two wheels, aluminum disc streamlining and internal expanding mechanical brakes. Aeron oil and air shock absorber units are used. The tail skid is a special development of the Ryan Mechanics. A lead rubber wheel is mounted on a steel bar pivoted so as to give the skid a major action and make it automatic steering, the slightest movement of the rubber being sufficient to swing the skid. The shock absorber unit is





## Crated *or* Loose ?

Some Detailed Information About the Proposed Change of Item No. 3  
Page 55, Consolidated Freight Classification No. 5

By RALPH H. WOOTEN  
Canton, Ala. Circuit

**O**N JAN. 20, 1956 a hearing was held in New York that was of vital importance to aviation. The real outcome proposed to change Item No. 5, Page 50, Consolidated Freight Classification No. 5, so as to eliminate the word "house" from the present description for railroad shipments of airplane parts, thus requiring that airplane parts contained in this item, when in railroad, be in containers required for the most articles when shipped in less than railroad quantities.

This change might appear to be insignificant and of no importance to most people, but it developed a great deal of interest and opposition from the government and manufacturers and shippers of aircraft. This is attested by the fact that practically all branches of the government, interested in aircraft, headed by the Assistant Secretary of Commerce for Aeronautics, W. P. MacDonnell, including representatives of the Army Air Corps, Bureau of Aeronautics, Federal Bureau of Investigation, Federal Bureau of Prisons, Federal Trade Board, the Aviation Industry, represented by the Aeronautical Chamber of Commerce, a committee representing aircraft manufacturers, and representatives of individual aircraft companies, were so united to protest the change proposed by the members to their representatives, the Consolidated Freight Classification Committee. The latter may still wonder who such a firm should be meant about such a little word as "removed." And a description of a freight class? What is removed about aircraft?

If you will go back a few years in your memory to war days you can probably still picture loads of flat cars with large cylindrical crates being moved from a road's factories to various fields. If you were at one of these fields you probably still remember these crates being unloaded from

the cam being opened up, the planes being left in an open position for the flight, and the pride and joy of "taking off" was on the new job. You also probably remember the airplane back on some corner of the pool where the flight was made, and that every time you saw there came, you thought what a useless waste of time and money it was to park these planes in such a manner for deposit. We can leave them in care for shipment, thereby, saving a



Folded Transparencies wings tucked on sides for shipment. To that three more are required, the wings being loaded as follows:

of time, material and money, or better still, why not fly to the field.

This idea occurred to other people, and in due time they were taken to get a change in the freight classification for airplanes which would permit shipment faster, more economical and checked in cases. This classification has been made, and as all shipments, whether or not they are actually checked, are now uniformly prepared, went through without change for faster. It was not apparent why the carriers should demand a time which would, in effect, require shippers to open up to the expensive and wasteful practice of having parts of airplanes for shipment at checked rate. The reason is that the carriers are not required to handle the cargo as fast as a representative of the railroads that shipments had been made by the U. S. General Accounting Office or other governmental shipments of airplanes and airplane parts on the basis of less than air-rail shipments on air-rail shipments which were formerly shipped by air. The carriers are not required to handle the cargo as fast as a representative of the railroads that shipments had been made by the U. S. General Accounting Office or other governmental shipments of airplanes and airplane parts on the basis of less than air-rail shipments on air-rail shipments which were formerly shipped by air.

From 1918 to 1933 the government has been the largest shipper of aircraft. Since 1935 commercial airlines have made several strides that it is doubtful whether the government can still be claimed. In 1937 there were about twice as many commercial airplanes manufactured in the U. S. as military aircraft, and a very large proportion of these planes were delivered to purchasers by mail. One company alone had over 400 strictly commercial planes in 1937. This is a large number that the Army Air Corps produced from 1933.



showing how an observation type of airplane is fitted into  
an area and out

### A Modern Penguin



Every Band and the Mason Brothers, combed the entire area, transported their loads from Paris to London where they had an engagement. They are shown here at Le Bourget Field making arrangements for the transportation of the loads by plane. Notice the big knee pads on the ground which will prevent it from "bumping its shins" while on the move.

### Give "Youngest Mail Pilot" Title To Warren Vine of Cincinnati, O.

**THOUGH HE** is but 22 yr. old, Warren Vine of Cincinnati is a pilot on Continental Air Mail route 26, which is operated by the Embury-Hoffle Co. between Cincinnati, Indianapolis, and Chicago. Cincinnati records call Vine the youngest pilot licensed to transport air mail.

Vine got his start at the age of 16 when he began to "hang around" the Blue Ash landing field where Mack Watson was taking up passengers. One of the pilots was John Paul Riddle, now general manager of the Roney-Riddle Co., and Vine, who was interested in getting a free flight now and then, attached himself to Riddle and made himself useful doing work, fixing tires, putting in gas, wiping off oil stains, and the like.

Before long Vias pressed the aviation for induction, and when the Grand Field at Blue Ash was abandoned by the government for London Airport, he had become a pilot with enough hours to become a passenger carrier.

"Bugsby", as he is nicknamed, later became a pilot on the Eukry-Riddle Co.'s express line between Cleveland and Louisville, and now with the inauguration of the air mail route he has enrolled for the C.A.M. 24.

## Chance Vought Corp. Will Move From Long Island During 1928

**DEFINITE DECISION** to move the Clanton Yacht Corp. from Long Island has been made, according to a recent statement by Timothy W. Joyce, manager of sales and service of the company. Sometime during the present year the company, which is now located at Long Island City, will make the change.

Although the new location of the Chance Vought Corp. has not been definitely decided, it has been stated that Baltimore, Md., is being favorably considered.



The Alston monophyllous "American Girl" on the ramp at the store of the Roosevelt Field museum.



## *The Roosevelt Field Runway*

### Some Information About the Starting Point of Some of the Recent Long Distance Flights

By ROBERT M. GIBSON

[illegible]

When the America Travel-Oceanic Company took over the

[illegible]

was not going fast enough to intercept off the top of the wheelbarrow. That slope is really quite a gentle one and a number of plants, including the heavy *Stellaria media*, have been traced from Curlew Field up to the level of Rosecrans Field. Another great advantage in taking off at this distance is that the birds are able to take off from the field for nearly a half mile. The first obstacles encountered on the Curlew baysides of the far end of that field and then only as locally above the level of the take-off on Rosecrans Field were good conditions, however, there are tricky areas arising from the gully separating the two fields, and the rising part of the proposed taking off a heavy plane would require that these conditions form a very suggested wind upsets.

### Eight Fresh Slide-Way in History

At the beginning of this runway the American-Trans-Oceanic announced a conservation diet and wood framework ramp to help in getting the plane started. In the center of this ramp is a shelter of charcoal seen for the tail end, provided it is big with a post where the skid can be tied, for releasing the engine are running full-out for the start. The runway will take a skid not more than eight inches wide for charcoal in about four inches deep.

On each side of the center tail-shed channel, is placed a ramp for the landing wheels. This runway has a width of 10 ft, and is made to the other of eighteen feet, so that the greatest width of landing gear wheel can be accommodated without obstructions or overruns feet. There is almost no head to the tail of airplane that the ramp will safely carry as a solid unit but has been built up under all of the ramp on wheels. It should well meet or run. The tail shed load is all that is supported by wooden truss-work, which appears to be sufficient for all reasonable loads.

The overall length of the ramp is about sixty feet. Forty strong earth embankment and twenty feet wooden treads. A risk in the plans can be taken, the tail-chord will be about nine feet above ground level, and the wheels about ten feet above ground level. These dimensions should enable the State designer to make a close estimate of the initial speed. It could be corrected in the plans by the engineer.

## Options On Length Differ

known as to the length of runway available under which the usual estimate is that it is made from the foot of the hill to the edge of Rosecrans, to the gulch which separates Forest and Chapin. Mr. Walker, who should have been in possession of the most accurate data, stated that it was not so long. At the time the case for this article was about being set on the way available for measuring the runway, the case with the speaker of an automobile. This used a mile more than seven-fifths of a mile, about 3700 ft.

ten hours, who took off the Fokker tri-engine for the first flight since it was found to have been impossible to land that plane without the aid of the starting ramp. A tail of the runway was but three hundred yards away from the tail was raised, and only seventy-five to a hundred feet from where the wheels left the ground, this staggered the insertion of the tail into the runway, the tail of the ramp at all, going off in the opposite direction, and being in one side of it. For the second landing attempt the New York Times, Scheller, and the ramp very of the ramp for the Stinson monoplane. Eddie Stinson attempted to land it, but the plane had been damaged by the ramp. The plane was released and off to the left side of the tail of the ramp.

said they were out of the way, turned back on the runway, and took off from there without using the ramp.

It should be noted that there is no machine shop or repair shop in either of the hangars at the field. The nearest repaired shops are at Curtiss Field and the factory of the Curtiss Aeroplane and Motor Co. about a mile and two miles away, respectively.

## California Aviatrix to Attempt Rome Flight in Mahoney Plane

FROM HOLLY City, Calif., to Rome, Italy, by way of Washington and New York in the flight announced by William E. Baker, founder of Holy City, for Mrs. Evelyn Hutchinson of San Diego, Calif. Mr. Baker is financing the proposed flight. The spirits will enter intensive training at San Diego to develop her flying knowledge and will attempt a one-stop flight to Washington, it was announced by the B. F. Webster Aircraft Corp.

A contract for construction of a plane virtually duplicating Colonel Lindbergh's NYP monoplane was entered into recently for the army, according to an official of the Macahey company. The plane is due to be completed in March 28.

Before she takes off early in April for the Eternal City, Mrs. Boomerang said she will attempt to make the record flight of 55 hours now held by German airmen. This would be undertaken in connection with the non-stop flight to Washington. She hopes to reach the capital and then remain in the air until the record is broken.

The name of the Midway plane is what Mrs. Rosenzweig plans to make the flight to be "The Spirit of Holy City Love." It will be decorated with appropriate ornaments. Holy City is the Santa Cruz magazine. The plane will have a passenger capacity of 400 and will utilize the same wing which captured Colonel Lindbergh on his trans-Atlantic flight. The fuselage, due to new engineering and experience, will be capable of carrying two pilot seats. Who will accompany the straining has not been announced. Mrs. Rosenzweig hopes to leave the east coast for her second year before a year following Colonel Lindbergh's historic flight of May 20, 1927, will have closed.

## Felix Steine Is Temporarily Transferred To Denver Airmail

**FELIX STEINLE**, Salt Lake superintendent for the Western Air Express handling the mail from Los Angeles to Salt Lake City, has been transferred to Denver to take charge of operations for his Company on the Cheyenne-Denver-Pueblo normal line. It is only a temporary change and Mr. Steinle hopes to be back in Salt Lake in 90 days.

## Aerial Map of Boston Completed By Air Service of New England

**AIR SERVICE** of New England, Inc., has completed and delivered to the city of Boston a new aerial map of the downtown and Back Bay. They have also delivered new city maps to Brookline and Revere. President John D. Hingham stated recently that the company would have \$50,000 worth of mapping estimated for before the spring mapping flights are begun.

# New Life for the Old OX5

Miller Airplane Products, Inc., Seeking to Aid OX5 Owners and Carry Plane Manufacturers Over a Critical Period

By LESLIE C. MILLER

President, Miller Airplane Products Corp.

I HAVE BEEN asked why the Miller Airplane Products organization is engaged in manufacturing accessories for the Curtiss OX5 engine when it is known that all stocks of this engine are nearing depletion. As a matter of fact we are seeking to aid the OX5 engine owner and at the same time carry the plane manufacturers over this critical period during which there are so many new OX5 engines and all new production air model jobs are still too expensive for popular distribution. Airplane factories throughout the country have doubled and redoubled production capacity until it seems that they may be able to supply the demand for new production commercial planes during the year 1933. But it is well known that all stocks of new OX5's will have been used by the first of April, and more new production engines will be too expensive for the average operator the manufacturers are seeking to sell the planes minus engine, meaning that the purchaser must either purchase a new engine or rebuild his old one.

In a personal visit last of every state in the country since the war I have been able to ascertain that of more than 37,000 OX5 engines known to have been in storage at the close of the war, at least 6,000 are now available for overhaul and rebuilding, according to our system, and installation in new commercial planes. The statistics that I have gathered during a flying itinerary which carried me to 41 states of the Union in the past 18 months are rather interesting as showing just how many engines are available if we care to replace them.

## 3,000 Engines in New Production Phase

Fifteen thousand new and several thousand overhauled OX5 engines were known to have been in storage in the country at the close of the World War. About 3,000 of these engines are now installed in new production planes, 2,000 in old Zenos, Cornells, and Standards, perhaps 1,000 have been built in time and markings, 1,000 are estimated to have been installed in racing cars and speed boats, 3,000 are in the hands of aircraft manufacturers and will have been installed in place by April 1, and 1,200 are now known to be in the hands of aircraft supply houses. These figures, although approximate, were arrived at after I had personally landed on practically every field in the country and had worked and examined stocks of engines in every known workshop, factory and hangar, and I believe show that there are now at least 3,000 OX5 engines that will be installed during the next year and reconditioned for use until such time as the new air model engines may be produced and sold at a reasonable figure.

Experience has taught us that a properly reconditioned engine that has been overhauled according to the manufacturer's plan used in our plant, will be more powerful, reliable and economical than it was when new and will be good for as many

Leslie C. Miller, who piloted an Alexander Eaglerock to second place in the Class B New York to Spokane Air Derby, has formed an organization known as the Miller Airplane Products Corp., located at 3827 W. Jefferson St., Los Angeles, Calif. The company specializes in rebuilding OX5 engines and in producing OX5 accessories and tools.

Mr. Miller has had 18 years of experience as an automotive engineer and has been connected with aeronautics for the past 21 years. As sales promotion manager for the Alexander Aircraft Co., he visited almost every flying field in the country and spent a great deal of time in analyzing and correcting the faults of Curtiss OX5 engines.

more hours as it may have already served prior to our reconditioning.

Figures which we have gathered over a period of two years that all parts necessary to overhaul an OX5 engine as well as complete as the average engine price, will not cost less than \$250.00 including all parts that we supply and all standard parts that it may be necessary to replace.

All Miller Airplane Products have been developed since a personal, flying knowledge of the OX5 engine and its faults and are based on an experience of 18 years as an automotive engineer, 11 of which were in connection with the aviation industry. Every fault of the OX5 engine has shown itself in use while in flight and the time and trouble has been taken to work out ways to get rid of each of these faults.

To begin with it has been the practice of OX5 owners to discard the cylinders when valve guides and seats have worn. This was logical enough when cylinders were selling at \$5 apiece but now that they are \$200.00 it is apparent that some means of renewing valve guides and seats must be devised.

To ease for this condition we have a complete set of tools so designed that any operator may use them with a need of but one additional tool, a vice. This tool of repair of a pig with bolts to the top of the cylinder and also in place holds a master in absolute alignment to the valve guide. This master is hand operated and easily removes the old guide and makes a new hole, after which a tap is inserted through the main jig and threads are cut in the valve guide hole. We also manufacture the new bronze or gray iron valve guides which are threaded and which screw into the threaded hole

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at the exhaust and tap. When this is done a second cutter set at a 35 deg angle is operated through the new valve guide and stems out the valve guide, removing the old end and making the port. A third runner set at a 45 deg angle makes a new seat and a fourth runner removes the



Leslie C. Miller standing in front of his Eaglerock plane in which he won second place in the Class B New York to Spokane Air Derby.

new seat. The experiments prove that there is plenty of material in the cylinder head to allow for the widened port and several valve manufacturers are now leading valves for the OX5 with longer heads to operate on the new seats. By the use of these tools in the most slightly best outlined, two cylinders may be restored at a cost slightly less than that of two new cylinders, and the operator will have the set of tools.

To meet the demand for an improved valve operating mechanism we have designed and set in production a new self-aligning, shut and trouble proof rocker arm system. In designing this system we have eliminated all of the faults found in the former overhead system such as breakage of roller necked shafts, loss of gas, and premature wear of bearing surfaces. This new overhead valve system also incorporates our patented intake valve necked, which greatly increases the efficiency of the OX5, as well as our roller rocker arm for its reduced valve which provides premature wear on exhaust valve guide and seat. Our overhead system is also designed to be much longer lasting because it is held under pressure by use of the Cincinnati Ball Creek Driftless Oil Cup such as all recent famous Whitehead equipped planes have carried in the use of this cup we have eliminated the necessity of frequent oiling of the rocker arms and so there is a minimum loss of lubricant under pressure in all bearing surfaces, the result is many times greater life in the overhead system.

## Distributed OX5 Information Book

Not only OX5 we accomplish the replacement of cylinders and valve actuating mechanism in this manner but by printing and distributing a little book "How to OX5" which incorporated all of the information that we had gathered concerning the OX5 engine we have sought to supply the thousands of OX5 owners that would enable them to rebuild these engines for long service.

Everything which we have done thus far has been with the low end engine done, not of delaying the coming of the new production engines, but to make it possible for the individual operator to construct engines comparable with present equipped until new engines of greater dependability and low cost have been developed.

With the quantity production that is now in sight it is evident that the year 1933 will show a material decrease in the cost of new production engines, thus placing them within the reach of the great percentage of present prospects.

While this same decrease we expect to be in a position to offer an entirely new air model engine to the public, as well as our service on the rebuilding of OX5 engines. The new engine now being developed will possess every quality to be expected of a good commercial engine and will be a worthy successor to the old Curtiss OX5 which has thrived its way for so many thousands of hours across the sky, the motor power for aircraft of almost every description, and the mechanism upon which the commercial aviation industry has been founded.

## First Meeting and Dinner of Glider Club Held in New York

SIXTH OF activity in the field of glider construction and operation in the United States are evidenced by the recent formation of the American Motorless Aviation Club in New York. It is understood that the movement is being sponsored by the North German Lloyd Line and that some gliders of three different types will shortly be brought to this country from Germany. It is also reported that two glider experts, one designer and one glider pilot, will come to the United States before long.

The first dinner of the club was recently held aboard the Lloyd Line Catalina in the Hudson River, New York City. The dinner was followed by a talk on gliders by Maj. Vernon Chappell, president of the Greater Brooklyn Flying Club after which three reels of motion pictures were shown. The pictures were of the 1921, 1922, and the 1925 Rhine Glider Contests held in Germany. Following the motion pictures C. E. Froehlich, secretary of the American Motorless Aviation Club, spoke on the possibilities of motorless aviation. Dr. Konrad of the U. S. Weather Bureau spoke on the meteorological knowledge to be gained from gliding. Lieut. T. L. Hill was the last speaker discussing motorless flying as aviation sports.

Interest in gliding has been very lax in the country during recent years and it is hoped that there will be more activity in the near future. Growing with its aerial glider pilot contacts has had an incentive for glider competition which has been provided by a wealth of aerodynamical and meteorological knowledge.

## Kinner Airplane and Motor Corp. Receives Numerous Engine Orders

FULL PRODUCTION of the five cylinder Kinner airplane engine has been ordered by recipients in March 1, according to a recent announcement from the Kinner Airplane and Motor Corp. of Glendale, Calif. This power plant is of the radial air-cooled type. The many orders received for the engine, which is entering its third year, appear to show in the field from which the OX5 is rapidly disappearing, according to figures which indicate that planes for 1933 manufacturers will be 3,000 Kinner engines.

It is said that the Kinner engine showed no weak points when recently submitted to a 50 hr flying test but even though 50 of the hours were run at full throttle. An official 50 hr Department of Commerce test run is now to be made by the U. S. Navy at the San Diego Naval Base.

# The Turnbull Variable Pitch Propeller

**L**AST SUMMER the Royal Canadian Air Force at Camp Borden, Ontario, completed a series of successful tests and winning tests on a variable pitch propeller that has been under development for a number of years. The design was by W. H. Turnbull, P. R. C. S., at Buffalo, New Brunswick, Can., who is one of Canada's pioneer aviation engineers. Mr. Turnbull's first full-scale propeller was one of the Tenthredine class, New York, February 1925, and it went through successful starting tests at Camp Borden, the previous year, but was unfortunately burned in a fire that occurred there in October 1925.

The propeller was so designed that the blades, when necessary, gave a great deal of resistance to the air, and this was (V. P. Prop. No. 2) was built by Victor L. L. Montreal, and at the time that has been so successfully tested at Camp Borden this past summer.

The advantages to be gained by a variable pitch propeller have been understood for a long time, but the mechanical difficulties to be overcome in the mechanism, and the fact of a practical, and "load proof", control for the pilot, have apparently been insurmountable up to the present time. The design and construction must be such that the blades move freely about their socket, and, while subjected to a great stress due to the centrifugal force, and the lower stress due to the thrust, while the control must be entirely subject to the pilot's will and be capable of being moved, not too slow, but the pilot to get just the correct pitch for any desired condition of flight.

## Blades Weigh 35 Lb. 3 Oz. Each

To illustrate the great stresses that occur, it is to be noted that, although the blades of Mr. Turnbull's variable pitch propeller No. 2 only weighed 35 lb. 3 oz. each, and the centrifugal force caused a weight of 37,150 lb. (with engine at 1350 r.p.m.) as the full thrust motor, on which the blades turn, and the thrust load, computed as 265 lb. at 575 r.p.m., imposed a maximum bending moment of 3109 in.-lb. at the joint, the load being carried by a metal-thermo steel spindle of 1½ in. diameter (giving a factor of safety of 20.4).

The design is the more remarkable in that it is a composite one, i.e., a combination of wood, with steel and brass, and the "carry over" of the stresses from the wooden parts to the metal ones has been very cleverly worked out. While the composite propeller has given very successful and promising results, it is considered that an all-steel design is now indicated, since the general trend in propellers seems to be towards the all-steel type, and it is expected that the all-steel variable pitch propeller will soon follow as a natural



The Turnbull Variable Pitch Propeller (No. 2) is a 130 hp. Clerget engine with an Aero plane.

consequence in the successful tests on the composite propeller. On the question of control-mechanism, Mr. Turnbull is carried out extensive tests on many types, extending over 11 yrs. since he has finally adopted a small electric motor (mounted forward, and at the center of the hub) on gears the last source of pulsation. This is a control in which there is no possibility of mechanical shock, even at higher speeds, and one which can be regulated to any desired speed of action, by simply changing the gear-ratio and power of the motor. With earlier variable pitch propellers, the action was either too rapid, for accurate setting of the blades, or they were subject to mechanical shock which was dangerous at the high rotations involved.

In the variable pitch propeller that was tested at Camp Borden, last year, not only was the control mechanism, but there was an electrical indicator, on the pilot's instrument board, which showed the pilot just what changes of blade angle he was making; it also showed him to duplicate settings, and to adjust his pitch for best results, in any condition of flight that he wanted to arrive at.

The variable pitch propeller No. 2 was designed for a small antiquated machine and engine (an old two-cylinder Aero engine, with 130 hp. Clerget engine, at 1250 r.p.m.) but one other could be afforded to the tests, and it was therefore a question of "blowing the choice." That the test results should be so good, under the circumstances, is remarkable, for the machine was very old, and the engine very "rough," but it speaks well for variable pitch propellers, as "standard equipment," on modern machines, and on smooth-running engines.

We here give a brief summary of the tests that were made out last summer, and a study of these, particularly the dash test, and the consumption tests, clearly indicate what a revolution will come, for long-distance flying, when variable pitch propellers come into general use. The related pitch, for

dash, will make it possible to get a very heavily loaded machine off the ground, while the correct pitch (with throttled engine) will enable the machine to cruise at "best cruising speed," with a minimum consumption of fuel, and will enable it to greatly increase its radius of flight.

Regarding whirling tests were carried out by Mr. L. L. A. E. West, June 1st, with control mechanism locked, in dash test engine reached 1350 r.p.m., for an instance, with pitch at its least angle.

Normal consumption, for engine, at 1250 for five minutes, or 380 for continuous running. At a later date, one whirling test was carried to 1450 r.p.m.—which represents a centrifugal velocity of 4645 ft. per sec.

In all 70 flights were made between June 28 and July 8, lasting from a few minutes to one hour and 35 minutes, at two, and seven different pitches loaded the machine, at different times. Mr. L. L. A. E. Brooks was in charge of the test, and did all the flying in which accurate timing, for performance, was attempted.

The blade angles, where given, are the angles of the blades at 50 degrees, on 800 mm. and the extreme range of the blades, at this radius, was 135° deg., via—from 135° deg. to 50 deg. The designed normal pitch being 35° deg.

The speed test flying level at 1000 ft., gave 74.3 m.p.h., with an angle reading of 30.7 deg., and r.p.m. at 1250. This was 2½ deg. below the designed "normal" pitch, for example, but the design had been intended with top speed given to 80 m.p.h., and made a speed was quite out of the question for the "P.L." machine, which was an old AVEO (No. 2) in use, with a Clerget engine which was well below its rated power, of 130 hp. at 1250 r.p.m. (3rd flight, June 30, 1931).

Other speed tests, at different levels, were carried out with a blade angle of 19.8 deg., (11th and 12th flights) and resulted as follows—

At 1000, Time Air Speed 75.5, Engine r.p.m. 1275			
"3000," " " " 71.2 " " 1250			
"1800," " " " 70.7 " " 1300			
"1600," " " " 64.8 " " 1175			

On dash test (12th flight) was made to confirm, with blade set as above (19.8 deg.), and which was scaled at 33,200 ft., the rate of climb was 100 f.p.m. (the plotting the result, the estimated actual climb was 10,000 ft., and maximum rate of climb, over the ground, was 600 f.p.m.)

On consumption tests, six flights were made, with blade angle, of 26.3 to 31.75 deg.—results did not vary much, and the best results gave a consumption of about 5 gal. of gas.



Upper: Aero fitted with Turnbull V. P. Propeller, D. A. E. indicator mounted on the instrument board.

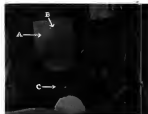


Diagram of cockpit of Aero fitted with the Turnbull V. P. Propeller. A Control switch B A. E. indicator that enables the pilot to tell his blade setting at any time. C Control lever for advancing and reducing pitch.

One per hour, as compared with E to 30 gal., with Aero machine, as usually used, at Camp Borden. The true air speed was 54.4 m.p.h., engine r.p.m. 158, at an altitude of 1200 ft., with blade setting of 35° deg., and gasoline consumption of 5 gal. per hour.

The testing was in charge of Mr. L. L. A. E. Brooks, who did most of the flying, but others, who flew the machine were Wing Commander Anderson, Flight Officer de St. Pierre, Flight Officer E. J. Doreau, Flight Lieutenant Brown, Flight Officer E. J. Doreau, Flight Lieutenant Brown, Flight Officer E. J. Doreau, and Flight Officer (Super).

As pointed out, in the Official Report, "The flying tests were not properly to determine how the V. P. Aero machine affected the performance of the aircraft. The aerodynamic features of variable pitch machines are generally well known, as are also the benefits accruing from their use. The aspect of the subject is to be found described in the following British R. & M. 363."

No. 822—The Variable Pitch Propeller  
No. 588—Thrust and Torque Coefficients of Airfoils  
No. 578—Full Scale Determination of Thrust Characteristics of Variable Pitch Airfoils

"The main objects of the tests were to establish that the apparatus was mechanically sound, that the blade mechanism was simply strong, that the pitch varying mechanism would stand up to continued use, and that defects in construction and design might be remedied in practice to reduce any unnecessary mechanism to failure machine. Arrangements were made accordingly that Aero 'P.L.' is to be flown for a total period of 30 hr."

"The test pilot (Mr. L. L. A. E. Brooks) expressed gratification at the extreme flexibility enabled by this propeller in the use of several and engine models. For instance, it is possible to take off at constant r.p.m. and to climb at optimum airspeed to the ceiling, keeping the r.p.m. constant at full engine speed (1200) all the way up. Also it is possible to increase the pitch, flying level, and at the same time, reduce the engine speed until a point is obtained where throttle as a factor is reduced without a loss of height. Thus is the theoretical best cruising speed. During all these trials, and after every flight, the mechanism and blades were carefully examined for straining or indications of any failure. None whatever was apparent. The blades retained perfect track and the mechanism gave no sign of strain or fatigue."









## Steamer Columbus Takes Junkers Seaplane "Taxi" on Southern Cruise

SEAPLANE "TAXI" service is available to the tourists who are now sailing to the West Indies and South America on the North German Lloyd liner Columbus, for a brightly colored Junkers plane bearing the name Globe Trotter is carried by this ship suspended on slings between



The Junkers seaplane mounted on the deck of the S. S. CO. COLUMBUS.

the two funnels. The Columbus, under charter to Raymond and Watson, recently stopped at New York prior to its trip south.

When the ship makes a stop during its cruise, it will take but a short time to lower the plane by means to the water and put it on readiness for sightseeing or other flights. Among flights which are to be offered are trips over the Canal Zone and from Colon to Panama.

Two small engines and several seats containing spare parts for the plane are carried on the Junkers, which has a wing spread of 67 ft. and is powered by two 220 hp. engines. Though an official fare rate had not been decided on at the time the Columbus docked at New York, it is expected that a charge of \$20 for 30 min. will be made to the passengers. Four may be carried behind the pilot and mechanic.

Walter Hagen, a member of the German Imperial Air Force during the war, pilots the plane. His mechanic is Rudolph Platow, one of the few Germans who was forced down at the Azores in an attempt to cross the Atlantic in the airplane G-24.

## Piston Ring Reduces Maintenance Cost and Lengthens Engine Life

JOHN C. HOOF and Co. of Chicago, Ill., has developed a number of devices for the prolongation of the life of engines, reducing the expense of maintenance and operation. One of these products, the Graphol piston ring is claimed to reduce the cost of maintenance on Liberty engines approximately besides adding from 100 to 150 per cent. to its life. Another development is the Hoof-Hendall graphite lined valve guide. These products have been in service test for some time and according to the manufacturer have met with complete success. It is stated that both the National Air Transport and the Ford Motor Co. have placed substantial orders for these products.

It is stated that the Graphol piston rings have been sub-

jected to a number of tests. One set was installed in a Buick automobile which has run over 100,000 mi. satisfactorily. Another set was installed in an OX5 engine about the same age and are still in service. Two cylinders of a five cylinder truck were equipped with Graphol rings, and the other two cylinders with ordinary rings. It is stated that at the end of 20,000 mi. the cylinders with the Graphol rings showed only 25 per cent. as much wear as the other two cylinders.

### Made With a Locking Groove

Graphol rings are manufactured with a locking groove, machined on the center of the outer surface of the ring as locking around the entire perimeter. This groove is filled with a graphite compound, processed to withstand the severe engine temperatures and oil conditions which may during the intake and compression strokes the compound, called Graphol, slides oil from the wall. Under the ring and exhaust strokes, when the oil is forced off the cylinder walls, the compound will deliver its stored up oil to the walls. It lubricates when lubrication is most needed. It can be relied upon to lubricate the cylinder walls in the total absence of oil for great lengths of time. Furthermore, if the cylinder walls are pitted, Graphol will fill in the pits, making the walls smooth and frictionless.

## Announcement Made of First Sale Of Prudden All-Metal Monoplane

ANNOUNCEMENT of the sale of the first all-metal Prudden all-metal monoplane was made at the company's offices recently by A. J. Edwards, sales manager. J. W. Henshaw of Fresno purchased the machine. At the same time it was announced that Henshaw has been appointed California distributor for Prudden planes. He agreed to take three more Prudden planes during the present year and other sales are contemplated.

The first Prudden plane sold, for delivery April 1, will be used for night racing tests over the Yosemite National Park, being in with tourist spectators. It will be an eight-place plane. The wing spread of this plane will be 67 ft., the chord 7 ft. 6 in., and the plane will be powered with three Buick-Groves engines. It will have a service ceiling of 15,000 ft., and a cruising ceiling of 10,000 ft. The plane will cruise at 90 m.p.h., have a maximum speed of 115 m.p.h. and a landing speed of 55 m.p.h.

## Hartland Engine and Machine Co. Building Seven Cylinder Radial

A SEVEN cylinder air cooled radial engine is being developed by the Hartland Engine and Machine Co. of Portland, Wis. H. M. Beversick, consulting engineer, has been working on the engine for the past two years. It is designed to develop 125 hp. at 1600 rpm, weighing 230 lb. with its magneto but without starter or generator. Though the engine is slightly heavy the designers state that they are averse to their attention being attracted to its economy.

The Hartland Engine and Machine Co. was organized in November, 1927 after successful preliminary tests on Buick engines. Alfred Nelson is president, Dr. J. H. Grubb, vice-president, Arnold Hocking, secretary, and Henry E. Hocking, treasurer. It is anticipated that the first engine will be installed in a plane about the first of March. A detailed description of the engine will appear in AVIATION after it is complete.

## IN THE AVIATION FLOODLIGHT



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On the Lone Eagle*

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It is evident that the manufacturers should equip this plane with a landing gear giving maximum protection to ship and cockpit in emergencies. Aerol Struts Aircrafting Struts were selected as standard equipment. This is of great importance in "Lone Eagle" service for these reasons:

Aerol Struts shock loading instant equal to normal loads the weight of the plane without shock, thus protecting ship and cockpit from destructive shock. They absorb shocks coming over almost any ground, thus giving comfort and complete control.

Forward landing gear has no bearing with these primary members of air and oil between the ground and the ship.

Aerol Struts operate on the first shock absorbing principle known — compression air and oil. The impact is resisted by the telescoping cylinder and the resulting air compression dissipated through the oil, thus absorbing shock.

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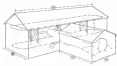
Wichita, Kan.



## Butler Mfg. Co. is Marketing "T" Shaped Hangar for Plane Owners

BUTLER MFG. Co., of Kansas City, Mo., is marketing a hangar designed especially for the private plane owner. The frame is of stainless steel and the sides and roof are covered with galvanized sheet steel, which is bolted to the structural members. The general shape of the hangar in plan view is that of a "T", and the whole design is worked out so that there will be a maximum of waste space and a resulting maximum of material.

All of the structural members of the frame are of steel and come from the factory ready for erection. Bolts are used in



Perspective drawing of the "T" shaped hangar

erecting the frame and the sheet metal side and roof panels are bolted directly to the structural members of the frame. The steel sheets are 26 gauge galvanized, and each has deeply drawn, painted reinforcements which are claimed to give them extra strength and stiffness. Since the panels are securely bolted to the rigid steel frame by galvanized bolts there is no movement from loose sheets rattling every time the wind blows. This bolted construction also gives a building that is much tighter than can be obtained by attaching side and roof sheets to the building with nails bent around panels and girts. It has been the experience of the manufacturer that



The private plane "T" shaped hangar placed in the market by the Butler Mfg. Co.

an unlined building of the Butler type is as tight as a windowed building where the wall and roof sheets are attached with nails.

The hangar is well equipped with windows and doors operate on steel rails and are roller bearing equipped. Certain type steel doors mounted on overhead steel doors and operated by an electric motor can be thrust open as doors can be pulled and pushed various other methods. The hangar is so designed that opening the doors opens up the entire front. In this way there is a maximum of waste space around the ends of the building and the width of the building has to be very con-

crete longer than the wing span of the plane and the width of the door opening.

The "A" dimension shown on the plan view drawing may be 20 ft., 25 ft., or 30 ft., and the "B", "C" and "D" dimensions remain constant at 14 ft., 18 ft., and 22 ft., respectively. The front section of the building is 24 ft. high and the rear section is 8 ft. high.

This type of building has all of the advantages common to steel sheet covered structural steel buildings. It is absolutely non-combustible, easily moved and can be put up in any kind of weather is a very short time using only common labor. If it is ever found advisable to move the hangar it may be dismantled, moved and reerected with practically a 100 per cent salvage of the original material.

## Complete Western Canada Airways Order Calls for 14 Fokker Planes

WESTERN CANADA Airways of Winnipeg, Man., recently more than doubled the first order it had given to the Atlantic Aircraft Corp., Hawthorne Heights, N. J., for six Fokker airplanes making the total now called for 14. The complete contract calls for eight Standard Fokker Universal planes equipped with Wright Whirlwind engines and six Fokker Super Universal powered with Pratt & Whitney Wasp. This order—one of the largest ever received for such an aircraft—represents a total cost of approximately \$300,000. A few of the new planes have already been delivered to the Canadian company by David. Herri Rabbin, co-pilot on Commander Brer's trans-Atlantic flight to France in the Fokker plane America. Western Canada Airways equipped Lieutenant Brer's to ferry the new airplanes in from New Jersey following the award of the initial contract.

### 300 Flying Hours Per Plane

The 14 planes of the present order will supplement the Fokker Universal which Western Canada Airways have had in operation during the past year for maintaining a service in the Red Lake area and Central and Northern Manitoba. Up to the present time, these planes have had an average, it is said, of approximately 300 flying hours per plane and have carried during eight months of service more than 50,000 lb. of express as well as hundreds of passengers. This is believed to be a record for length of service among planes of this type equipped with the Wright Whirlwind 20 hp. engines.

The Winnipeg company is a leader in Canadian commercial flying. The service is maintained during a great part of the year under difficult as well as hazardous conditions, but none and also being used on the planes on standard equipment.

## Navy Dept. Orders 100 Engines From Wright Aeronautical Corp.

THE WRIGHT Aeronautical Corp. has been given an order for 100 300 cylinder air-cooled airplane engines by the Navy Department, according to a recent announcement. The engines ordered are 325 hp. Cyclones. Inclusive of parts they will cost \$1,311,522.50, it is stated.

These power plants are to be installed in the new 100 seat patrol planes now being constructed by The Douglas Co. of Santa Monica, Calif. Each of the 100 airplanes is to carry two engines, and when the contract calls for 20, the 300 Wright engines will represent a spare equipment of 100 per

# "I Like It Fine, It's A Dandy"

## COLONEL CHARLES A. LINDBERGH

APPROVED  
TYPE  
CERTIFICATE

No.  
17.



C. A. LINDBERGH, 2001, APPROVED TYPE CERTIFICATE, "I LIKE IT FINE, IT'S A DANDY."

The above picture was taken August 18th, 1927 at Kansas City Airport just after Col. Lindbergh completed a flight in an American Eagle.

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At the American Eagle race held at the Kansas City Airport, the American Eagle was every event against a field of entries in which every make of new production plane with the exception of this type was represented. The American Eagle did not know defeat in performance contests.

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With Quack 9 Cylinder 125 H.P. Radial Air Cooled Motor  
\$3350

WRITE FOR CATALOGUE



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## Bavarian Motor Works Gets Warp And Hornet Manufacturing Rights

THE PRATT & Whitney Aircraft Co., of Hartford, Conn., announces that exclusive manufacturing rights in its aviation engines for continental Europe have been given to the Bavarian Motor Works of Munich, Germany. The latter company is producing the outstanding engine manufacturing company of Germany. In the years since the war it has continued to develop and manufacture engines for use in commercial planes, and B.M.W. engines have been widely used throughout Central Europe since the great commercial airlines such as Lufthansa. The engine of its design has been of the water-cooled type, but the company desires to develop engines to meet the growing demand for engines of the type for transport planes. The adoption by B.M.W. Co. of American designed air cooled radial engines is of great importance and interest, and indicates American leadership in the fast developing field of aviation.

Officials of the B.M.W. Co. spent several weeks in the United States last fall, and made a careful survey of the trend of aviation engine development in this country. The development upon the air cooled radial type, which has no outstanding advantages for commercial use, and which has been well established in this country. After a complete survey their choice was Pratt & Whitney engines.

### Warp in Standard Equipment

Pratt & Whitney has developed and are producing two types of radial air-cooled engines—the 500 hp. "Warp" and the 600 hp. "Hornet." The "Warp" is standard equipment in the Navy Department in its single and two-plane fighting and observation planes. It is also used in the amphibian type. It will be remembered that during 1927 the "Warp" is the first plane established on recognized World's records.

Commercially, the Warp has already established an enviable record. Since July 1 a fleet of 20 Warp equipped Boeing Mail Planes have been operating daily over the Pacific Air Transport line from Chicago to San Francisco. The aggregate distance flown over this line is now approaching 100,000 miles. This constitutes the largest single commercial operation in the United States, employing entirely modern equipment.

In conjunction with the Aerial Survey operations in Canada, the Royal Canadian Air Force has leased the Warp will adapted to its conditions and has developed a considerable number of commercial planes in operation. Aside from these larger operations, the Warp is being increasingly used in individual cases for private flying in commercial operations, such as the Fairchild Super-Turmoil at the Fairchild Cabin Monoplane.

Starting next summer, its application in a three-engine transport plane will be demonstrated. The Boeing Airplane Co. now has under construction three planes of the six engine type for passenger service on its transport line. These planes will be powered with three Warp engines. It has also been recently announced that Western Air Express has ordered for delivery in the spring, three tri-engine Fairchild Super-Turmoil planes powered with the Warp.

The "Hornet" is just now going into commercial service in the Boeing line because of increasing mail loads which will be required that more power will be required, and the Boeing Company is planning the installation of Hornet in its standard mail planes over at least parts of their route. It will be remembered in this connection that the Hornet and the Warp are interchangeable in an airplane and that the weight difference is slightly less than 100 lb.

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BY LESLIE C. MILLER  
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Since 1915, on 124, adds 20 to 50 more to the engine speed when all valves from the overhead, quickly adjust valves in gas, leaving valves, valve guides and pull rods. OX's are improved and are in use in OX's in planes, speed, both and engine runs. Standard equipment on Alexander's Epsilon and now being adapted by other leading manufacturers.

PRICE, per set of eight, \$10.

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Preventing wear on exhaust valve guides and seats, doubles the life of the OX cylinder. The roller rolls freely across the valve stem end, instead of sticking and exerting a tremendous side pressure on the guide and valve seat as is the case with the former tappet. More power longer sustained.

PRICE, per set of eight, \$15.

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Includes the roller rocker arm and valve control, all valves in one cylinder are added valve control, remove from one cylinder. Ball Check Valve, Oil Cup (one cup is used on Transpacific Flight on Wheelchair). One pump, standard and oil-free. No. 10 and 100.

Price for Eight cylinders, less push rods, \$58.00. With rods \$90.

## MILLER VALVE GUIDE REPLACEMENT SET

Includes a set which fits in top of OX cylinder, through which a lead operated and mounted in shadow of valve to cut out old guide. A set operating through one set through the hole. We make the standard brass parts.

Complete Set \$35.

## Brass Valve Guides \$75

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Includes part reamer, and reamer and set reamer. Every thing necessary to make new seat as in old valve.

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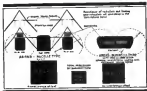


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# REVIEWS

**"AERIAL PHOTOGRAPHY"** by Duke M. Ryan, published by The Herald Press Co., New York. 32 pages. Price \$5.00.

As the greatest value in aerial photography is a reliable and accurate survey operations *Landmark Review*, this has divided "Aerial Photography" into two parts: the first, dealing with the making of aerial photographs and second with applications of aerial photography in defense, military operations. The first part of the volume demonstrates the technique of manipulating objects by various cameras and examples. The character of photographic details is explained going into detail on orientation and light and shade elements, etc.

Part two, which deals with the military applications, may be attempted to cover the subject sufficiently, but rather the military man in his use of photography and to aid in his knowledge about his profession. It tells how to employ photography in scouting, machine gun operation, artillery operations, communications, aerial operations, mapping, etc. There is also a chapter dealing with the most famous use of aerial photography. Illustrations are included and instructions are given for methods that have proved only to be a slight extent, especially in engineering work. This is due chiefly to the general unfamiliarity with the use. The book is written in clear, unadorned language and is illustrated with 125 photographs and drawings.

## N.A.T. to Offer Flight Souvenirs To Chicago Sightseeing Passengers

**PICTURE POSTCARDS** to be written during the flight as a souvenir plan as introductions of the same type will be offered to patrons of the National Air Transport Flying Service's day and night sightseeing tours over Chicago in late next month. Unlimited stockpiles and a return for will be offered by the two passenger Post-Flight air travel plan which will be used in the daily observation flights over the city and lake front.

The National Air Transport Flying Service, Inc. is a subsidiary of the National Air Transport, Inc., which operates mail planes and passenger service. Col. Paul H. Henshaw leads both companies.

The National Air Transport Flying Service also maintains that it will operate a four plane scheduled service in two years and even aviation trips.

## Tests for Pilot's License Passed By Head of Advance Aircraft Co.

**CLAYTON J. BRUCKNER**, president of the Advance Aircraft Co., recently completed his flying tests and became a licensed pilot. Though he has long been known as a first class pilot, Bruckner had not taken the government's examination since he was in the service. He had been in the service for some time, but had not been flying in an appreciable amount of time during the last two years.

The Department of Commerce examination was given by James Johnson, inspector for Ohio and Michigan.

## Oakland Chamber of Commerce to Conduct Plane Flights Over City

A VIEW and wider use of the airplane for commercial purposes is indicated in an arrangement recently concluded by the Oakland Chamber of Commerce with J. L. Mayberry, District distributor for southern California. The Chamber has accepted an offer of Mayberry to show the city to say aerial observation making a location.

Mayberry has placed a plane and pilot at the disposal of the Chamber for this purpose. As the industrial area of Oakland is large and of varied character, the Chamber's president, E. H. Field, declared the new system will give much more than otherwise would be lost as far as the industrial region about the city and would, in addition, give him a far better idea of the relative locations of the major view shows. Mayberry is a member of the Chamber and agreed to perform the service indicated as a contribution toward the rebuilding of the city.

## AC January Production Report Shows Increase of 25 Per Cent.

**JANUARY PRODUCTION** report of the AC Spark Plug Co. shows an increase of 25 per cent. over January a year ago, the previous best January in the history of the company, which employment figures showed a gain of 16 per cent.

The increase, according to E. W. de Galarand, president and general manager, is a reflection of the continued healthy business condition within the automotive industry, as it represents a larger original equipment business, for manufacturers as well as greater remakes through distributors and dealers.

Mr. de Galarand stated that four new AC buildings, including a new plant in Paris, France, had been erected during the past few months and that further plant expansion was now under way.

## Form Warren County Aviation Co. For Instruction and Sales Work

**INSTRUCTIONAL** WAS recently announced of the Warren County Aviation Co. at Phillipsburg, N. J. The company is engaged in commercial flying and instruction, and is in agency for the West plane.

The Warren Airport is located on the Phillipsburg-Whitewater route, just west of Phillipsburg and Boston, Pa. The field, which is of 50 acres, lies on the New York-Connecticut route and is easily reached by bus, which operates on a hourly schedule.

Walter E. Loffer is president of the Warren County Aviation Co. Thomas Laffer is vice-president, Oscar D. Kameron, secretary and Edith A. Kameron, treasurer.

## J. H. Duchon Holds Managerial Position in Lincoln Aircraft Co.

**J. H. DUCHON**, who formerly rendered advertising advice to about 30 Lincoln airplane companies and who has produced numerous successful campaigns, is now associated with the Lincoln Aircraft Co., Lincoln, Neb., according to a recent announcement. Mr. Duchon in his new position acts as sales promotion, business development, and advertising manager.

## The AIRSEDAN



## Safety

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## INSURANCE

Full coverage will be granted for all passengers, because they cannot interfere with the controls.

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Seating Capacity	pilot and 4 pass.
Weight Empty	2100 lbs.
Wing Area	320 sq. ft.
Span	47 ft.
High Speed (sea level)	125 M.P.H.
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Price \$12,500 Flyaway  
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Marquette, Michigan





# AIRPORTS AND AIRWAYS

## Hartford, Conn.

By S. A. Felt

The municipal board, heretofore used by land and transport for plane storage, has been sold to the Interstate Airways, Inc., of Hartford and Springfield, who will now rent all the vacant space at the rate of \$5.00 a night or \$60.00 a month. Sufficient space is available for the storage of some dozen planes. The Interstate Airways, Inc., has been awarded the distribution of the Travel Air plane for western New England, and will make its headquarters at this field.

Christian Jensen, Raymond Goodrich and Ernest Marston, all of this city, have signed and passed the test given them by Deputy Commissioner Louis Harry K. Thompson. They received their instruction from the L. & H. Aircraft Co., under the direction of Lieutenant Mather, its operating head and chief instructor. The L. & H. is the local distributor of the Swallow airplanes. Mrs. L. B. Elger of Schenectady, N. Y., will have a Swallow delivered in April. She proposes to fly it to her home field here.

The New England Aircraft Co., Inc., distributor of Waco and Fairfield Cables planes for New England, reports the

sale of two Wacos since the beginning of the new year. The company has also delivered three Fairfield Cables since its appointment as representative last November. Tom H. Spence, the president, reports that three models of Wacos have been ordered for spring delivery, the first is a two place, two and the others following shortly.

A pre-owned restaurant and rest room has been added to the many other facilities existing at Branford Field, located in the rear of the second hangar and has displaced its former uses formerly located there.

## Condensate Churns in Four Towns

Sergei, Charles F. Cain of the 43rd Air Squadron reports the leasing of interest in the condenser churns which have been built in four different towns in this vicinity.

The Colonial Air Transport, Inc., reports a gratifying season in their air mail test out from its field in a six month survey over a half year period. During the six months of 1931 only 717 lb. of mail were carried against 1864 lb. for the corresponding period of 1932.

## Cincinnati, O.

By Charles E. Finch

Col. H. H. Eber, head of the Department of Commerce airport division, recently visited "Turkey Hollow" from the air, along the complete area destined for Cincinnati's airport 1932. His statement was that the city has chosen wisely, and that the expenditure of \$250,000 voted by the city, and the airport will give the city one of the best airports in the country. The possibility of extending the present 250 acre field to a size of almost two square miles against the airport. Two roads, Richmond Lane and Irving Ave., bound the east and west ends of the tract, while the Ohio State River and a range of hills lie to the north. North of the field, the Pennsylvania Railway tracks are laid, and during these are residences and business houses. Perched on a hill to the west, 20 miles distant by automobile, Col. Eber also inspected the old Broadhead Field at Idle Air, 20 miles from the present field, to be used by the city as a second base between Louisville and Cleveland. This lot, about 180 acres in size, does not permit of such an extended expansion as the Lenth Airfield site.

Over hundred years from now, residents of Cincinnati will see at a picture of an Eber Eberle Co. use and plane and a picture of Stanley C. "Dogg" Hoffman, first pilot to fly in and out of Cincinnati.

## An Aeronautical Century Box

This will be the contents of the opening of a century box, placed in the new building of the Union Central Life Insurance Co., recently dedicated. What planes will exist in the box, what mail service will be available, what power plants will be used—these were questions among the air-minded in Cincinnati in reading about the contents of the box. A short description of aviation activities in Cincinnati was also placed in the box. Men cannot read 100 yr. from now will be looked on pictures in the new art of aerial transportation "way back in 1932".

As a result of the appearance of an aeronautical speaker before the Cincinnati United Grocery Association, the food store managed by that association will have an air mail display of 200 lb. of foodstuffs by the association. The Ohio Valley Food Distributors Association has also offered show values all over the city for air mail displays. These mostly consist of a wax dummy dressed in winter flying apparel, or mail stamps, or mail envelopes, etc.

The Eberle-Eberle Co.'s "new way aviation" contest" consisted of an open contest in various lines of aeronautics and tried to appear before meetings of clubs and associations in the interest of aviation, has already made its first appearance and has been successful in the past.

## Philadelphia, Pa.

Robert P. Hewitt, manager of field operations for the Lehigh Valley Flying Service, at the Philadelphia Airport, for the company's return Fairfield Cables to Lehigh Valley, Pa., recently, emergency certificate applicants and a wider to replace the broken undercarriage of a plane owned by Arthur Sals. Mr. Sals, who operates the Arrow Flying Service and operated to the Lehigh Valley airport in his first flying school.

The Lehigh Valley Flying Service has announced, through Eberle-Eberle, Inc., vice-president, the sale of two Waco 1000s and the arrival of five new planes at the airport.

W. Lawrence LePage, assistant to the vice-president of Philadelphia Airport, Inc., with headquarters here, has announced the purchase of a second Fairfield Cables (FAC) with Wright Tri-Plane engine by Colonial Western Airways, Inc., one of the Cincinnati to Buffalo air mail services.

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### Missouri, W. is.

By R. C. Pender

Patents for a wind director for airports on night flying have been granted to Frank Capenette of St. Louis. The new wind director includes a form of dial, known as windsock (it is seven foot horizontal flag which is light and to point with the slightest wind.

Establishment of a night air mail service over the lighted air line from Chicago to Dallas, Tex., will enable a mail service to save 12 hrs. in comparison with the time of mail service. A report on the new service was made out at the association of engineers.

In a recent address before the Junior Association of Commerce, H. Orley Voss, East 86. Lane, 24, president of the United States Junior Association of Commerce, urged its members to support an effort to establish and maintain adequate flying facilities in Milwaukee.

It stated that within ten years, the city without an airport will be in the same position as the town of today without railroad facilities. Mr. Voss stated that commercial aviation is here, and that last year planes in the United States averaged 20,000 a day over regular commercial routes carrying some 7,500,000 tons without serious accident.

"Since the perfection of safety devices in planes, the solution of the 'ground problem' will determine the future of commercial aviation," he said. "Many private associations are being organized, and it is the hope of the chairman, to sign that every local association will become actively interested in the promotion of aviation in the locality," he concluded.

### Northern Airways Displays Wagon

The new Wagon 16 was recently shown in Milwaukee by the Northern Airways, Inc., of Wisconsin. The plane was displayed for a week at the Milwaukee Aeronautics, which is located in the heart of the business district and through which thousands of people pass daily.

John Perry Wood of Wisconsin, who participated in the 1935 Wisconsin News Air Derby in his Wagon and finished first in the 1937 Ford Baby Derby and the New York-Spokane Air Derby last year, is sales manager of Northern Airways, Inc., distributors of the Wagon in Wisconsin. Mr. Wood announced that 140 contracts have been signed to purchase the plane at the Wisconsin manufacturing plant.

Louis, Robert Edward Sturdy, former manager of the St. Louis Royal Flying Corps and vice telegraph editor of the Milwaukee Sentinel, has been granted an airplane pilot's license by the Department of Commerce, it was recently announced. With the signing of the certificate, Lieutenant Sturdy became a reserve officer of the Army Air Corps.

### Kenosha, W. is.

A resolution urging the city council to direct the city engineer to a municipal airport for Kenosha at its "vertical air museum" was the result of several weeks of investigation at study by a Kenosha state council committee recently. The committee consists of Joseph G. Rhoads, chairman, Louis J. Whyte, and Elmer G. Hinesman. This committee was set up at an early meeting. It is understood that the committee has made a survey of available sites in Kenosha and is now to offer all the information to the city council for deliberation.

Two Kenosha industrial leaders recently returned to the city after a flight from Chicago to Detroit, where they attended, with a party of 17 citizens, a business conference with Henry Ford at the Ford airplane factory in Dearborn. Included in the party from Kenosha were Milton B. Farnsworth, president and general manager of the Nash Motor Co.

February 25, 1938

of C. G. Allen, vice-president and chairman of the board of directors of the First National Bank of Kenosha.

An air law to regulate civil state air commerce will be held by Frank Zambek of the Kenosha Post of the American Legion at the mid-winter conference to be held at Milwaukee, Wis., Jan. 24-25. The Kenosha Post, through Zambek, is the department of Wisconsin of the American Legion, which is now in fear of an interstate air regulatory law being met and is to have a special session of the Wisconsin legislature called to act upon the proposed air law.

### Kenosha, W. is.

Local residents by the government's agency, believe has a new plan for the Kenosha-Milwaukee airport. With the opening of the post, plans are now under way to form a club company to take over the flying field near the southern end of the city. The company would function to promote aviation here, and to do everything possible toward putting the flying field on the national air map. William J. Noell, who spent the summer at the Kenosha-Milwaukee Airport planning a commercial plane, has taken a leave as a mail pilot on a run between Milwaukee and Milwaukee. He expects to return to Kenosha next summer and to design the local airport.

### Waukegan, W. is.

Waukegan is the place of the name of Waukegan is a busy spot the very busy building of the Altona and Kenosha Air Co. will be sent out to all pilots in the building the Department of Commerce. Besides the name of the city in large white letters, arrows will also be painted on the top of the building to the airport.

### Baker, Ore.

R. O. Harter of Millersburg, Pa., who has the contract with the Department of Commerce to send business flights along a strip from Boise to Boise is now in Baker to check on the project in this country. The work is to be done in cooperation as soon as possible. H. J. Harter of Boise, who will be in charge of the work, is now in Baker. He is about 18 years apart, will be married in a few days. An emergency landing field will be at or near Baker. These fields are to be kept illuminated by use of night mail plane pilots, or others, in case of need.

The house in Baker County will be located on the corner of the town of Baker, on the highway near Harter, where the present house will be replaced, and at North President. The house is now under construction on the corner at Harter.

### La Grange, Ore.

It is the manager of the Varsity Air Mail Line, Chief Pilot Caldwell, both stationed at Boise, Idaho, when it was for several days supervising the construction of an emergency runway to be used in case of an emergency in which weather conditions will not permit regular flights over the Blue Mountains in the direction of Boise, Idaho, the northern terminal of the line.

### Bozeman, Ore.

Bozeman, 1000 more sheep range has been successfully for use. The ranchers estimated 5,000 lbs. of wool in the spring was, using a specially constructed hopper. In the spring it was 5.00 an acre as compared to the old price of 17.25 to 18.50 an acre. Even distribution was obtained which produced a good stand of grass.

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Like all machines that serve their purpose well, LAWRENCE's engines are the products of a fine technical imagination and patient experimentation. Behind the triumphs of LINCOLN and Pacific flights of 1927, the story in the Latin-American exploration over regions where engines failure would be fatal lie more than ten years of dogged development of the "Whirlwind." Encouraged and practically aided by the Engineering Division of the United States Army and by such far-seeing naval officers as Commander R. E. WILSON and Lieutenant Commander R. G. LEONARD, LAWRENCE restored the stationary, radial, air-cooled engine to Stator to build fighting observation and bomber planes which are in some respects superior to those of Europe and, above all, gave to commercial aviation an impetus which would result in the early establishment of passenger-carrying air lines throughout the United States.



THE universal acceptance of Wright Air-cooled Engines as a final expression in aeronautical motor efficiency is most substantially portrayed in the clipping reproduced herewith.

There is no surer barometer of public opinion than the editorial columns of a great newspaper.

WRIGHT AERONAUTICAL CORPORATION  
Paterson, New Jersey U. S. A.